

STARVE HOLLOW LAKE
Jackson County
2005 Fish Management Report

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EXECUTIVE SUMMARY

- Starve Hollow Lake is a 145-acre impoundment owned by the Indiana Department of Natural Resources (IDNR), Division of Forestry. It is located in Jackson County about 7 mi south of Brownstown in southeastern Indiana. Access includes three boat ramps; only electric outboards are allowed. Maps of the property are available from Starve Hollow State Recreation Area, 4345 South County Road 275 West, Vallonia, Indiana 47281.
- A survey of largemouth bass, bluegill, and gizzard shad was conducted June 1 and 8, 2005, as part of Division of Fish and Wildlife (DFW) Work Plan 204034, which is titled, "Gizzard shad experimental management strategies." The management activity being tested at Starve Hollow is an annual winter drawdown with a goal of a 50% reduction in volume during January and February. Starve Hollow Lake will be surveyed annually in early to mid-June from 2005 through 2009 to evaluate this drawdown strategy.
- A total of 1,992 fish, representing three species, was collected during this survey. By number, bluegill ranked first, followed by gizzard shad and then largemouth bass. By weight, gizzard shad ranked first, followed by largemouth bass and then bluegill.
- Bluegill PSD is well below the range of 20 to 60 that represents a balanced population. Bluegill reached 6.0 in TL in their 4th year of growth, which is average for southeastern Indiana.
- Largemouth bass represented a balanced population, but the PSD is approaching the upper limit of the desired range (40 to 70) for a balanced bass fishery. Largemouth reached 14.0 in TL in their 6th year of growth, which is average for southeastern Indiana.
- The electrofishing catch rate for gizzard shad was 520.7/h, which is a 74% increase from 2004.
- In Starve Hollow Lake, the DFW should maintain a 14.0-in minimum size limit on largemouth bass, continue to stock 2,320 (16/acre) channel catfish every 2 years, and continue to monitor submersed vegetation.

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INTRODUCTION

Starve Hollow Lake is a 145-acre impoundment owned by the Indiana Department of Natural Resources (IDNR), Division of Forestry. It is located in Jackson County about 7 mi south of Brownstown in southeastern Indiana. Construction was completed in 1938. Access includes three boat ramps; only electric outboards are allowed. Maps of the property are available from Starve Hollow State Recreation Area, 4345 South County Road 275 West, Vallonia, Indiana 47281.

Starve Hollow Lake has a 14.0-in minimum size limit on largemouth bass. Prior fish management activities include a fisheries renovation in 1987 and restocking of 14,572 largemouth bass, 35,650 bluegill, 36,250 redear sunfish, 1,819 black crappie, and 3,700 channel catfish. Starve Hollow Lake is currently stocked with 2,320 (16/acre) channel catfish every other year.

Starve Hollow Lake is scheduled to be surveyed from 2005 through 2009 under Division of Fish and Wildlife (DFW) Work Plan 204034 which is titled, "Gizzard shad experimental management strategies." The work plan objectives are:

1. Report on how the illegal introductions of gizzard shad have negatively affected sport fish populations and reduced fishing opportunities.
2. Determine the most effective way(s) to control excessive gizzard shad populations.
3. Determine how sport fish populations respond to various gizzard shad management techniques.

Starve Hollow will be surveyed from early to mid-June each year. Only largemouth bass, bluegill, and gizzard shad will be collected. The management activity being tested at Starve Hollow is an annual winter drawdown with a goal of a 50% reduction in volume during January and February.

METHODS

A survey of largemouth bass, bluegill, and gizzard shad was conducted June 1 and 8, 2005 under DFW Work Plan 204034. A GPS unit, GARMIN GPSmap 76, was used to record the location of the fish collection sites.

Fish were collected by pulsed DC electrofishing the shoreline on two nights with two dippers for 1.5 h. The lake's shoreline was divided into six 15-minute electrofishing stations.

The odd-numbered stations were sampled the first night and the even-numbered stations were sampled the second night. All fish collected were measured to the nearest 0.1 in TL. Not all bluegill and gizzard shad collected were measured; the length-frequency distribution and total weight was created by applying the percentages by half-inch group of the sub-samples of 621 bluegill and 367 shad to the entire sample. Fish were not weighed; average weights for fish by half-inch groups for Fish Management District 8 were used to estimate the weight of the fish sample. Fish scale samples were taken from largemouth bass, bluegill, and gizzard shad for age and growth analysis. Proportional stock density (PSD) was calculated for largemouth bass and bluegill (Anderson and Neumann 1996). The Bluegill Fishing Potential (BGFP) index was used to assess bluegill fishing quality (Ball and Tousignant 1996).

RESULTS

A total of 1,989 fish, representing three species, was collected during this survey. Total weight of the fish sample was approximately 428 lbs. By number, bluegill ranked first, followed by gizzard shad and then largemouth bass. By weight, gizzard shad ranked first, followed by largemouth bass and then bluegill.

A total of 1,049 bluegill was sampled that weighed 56 lbs. They ranged in length from 1.6 to 7.7 in TL, averaging 3.9 in TL. Relative abundance was 53% by number and 13% by weight. The electrofishing catch rate was 699.3/h, which is nearly identical to the catch rate in 2004; seven less bluegill were collected this survey than in 2004 (Kowalik and Lehman 2005).

Bluegill did not represent a balanced population; the bluegill PSD was 13, which is a 26% increase from 2004. Ten percent of the bluegill in this sample were 6.0 in (i.e. quality size) or longer, which is a 12% increase from 2004. The BGFP index was 17, which is in the fair category and a 13% increase from 2004. Growth was similar to 2004 and back-calculated lengths indicate bluegill reached 6.0 in near the end of their 4th year of growth, which is average for southeastern Indiana (Figure 1).

A total of 781 gizzard shad was sampled that weighed 197 lbs. They ranged in length from 5.5 to 15.7 in TL, averaging 8.9 in TL. Relative abundance was 39% by number and 46% by weight. The electrofishing catch rate was 520.7/h, which is a 74% increase from 2004 (Kowalik and Lehman 2005). Growth was similar to 2004 and is above average for southeastern

Indiana (Figure 2). Back-calculated lengths indicate some gizzard shad reach 6.0 in at the end of their first year of growth.

A total of 162 largemouth bass was sampled that weighed 175 lbs. They ranged in length from 0.7 to 19.4 in TL, averaging 11.0 in TL. Relative abundance was 8% by number and 41% by weight. The electrofishing catch rate was 108.0/h, which is a 24% increase from 2004 (Kowalik and Lehman 2005). Largemouth represented a balanced population; the largemouth PSD was 67, which is an 8% increase from 2004. Back-calculated lengths indicate largemouth bass reached 14.0 in near the beginning of their 6th year of growth, which is slightly above average for southeastern Indiana (Figure 3).

DISCUSSION

Starve Hollow Lake continues to provide fishing opportunities for largemouth bass and bluegill. The bass catch rate and PSD were greater than in 2004, and more legal bass were collected. The PSD, however, is now approaching the upper limit (70) of the desired range for a balanced bass fishery, which means that the number of 8.0 to 12.0-in bass is too low compared to the number of bass 12.0 in and longer. Although prey seems abundant (i.e. gizzard shad have increased in number and bluegill numbers are similar to 2004), bass growth has declined since 2004 at all ages; however, growth is average or slightly above the district average. Largemouth appeared to be healthy, but shad may be growing too quickly and too large to be susceptible to predation by bass for more than 1 or 2 years. Dense and abundant submersed vegetation may inhibit bass from foraging on small bluegill, which would have a negative effect on the bluegill population.

In the 2004 report, we stated that the bluegill fishery appeared to be declining, which may be correlated with the appearance and establishment of gizzard shad. The bluegill catch rate of 2005 did not show much change from 2004. The BGFP index increased due to more quality size bluegill collected, but the PSD was still below the recommended range for a balanced fishery and bluegill over 8.0 in were still absent from the collection.

An increase in the relative abundance by number and by weight and an increase in the electrofishing catch rate indicate that gizzard shad are more abundant now than in 2004. Shad growth is above average. In fact, by the end of their second year, many shad are too big to be utilized by predators in the lake except for large, older bass.

Gizzard shad have contaminated the ponds at Driftwood State Fish Hatchery, which presents several problems for hatchery personnel and Indiana anglers: 1) competition from shad interferes with game fish production; 2) extra work is required during pond harvest to ensure that all gizzard shad are removed from those fish raised for stocking in Indiana's public waters; and 3) there is a risk of accidentally stocking shad into Indiana waters where they are not desired.

Starve Hollow Lake should be drained and renovated to correct the gizzard shad problem in the lake and the problems associated with shad contamination of Driftwood's production ponds under the following circumstances: 1) if and when the lake is dredged by the Division of Forestry to address the loss of volume due to sedimentation; 2) if and when the lake is drained by the Division of Forestry to repair the dam; and 3) if and when the public wants to renovate the fishery in the lake without dredging it. Largemouth bass, bluegill, redear sunfish, black crappie, and channel catfish would be restocked by the DFW following the fisheries renovation.

RECOMMENDATIONS

- Starve Hollow Lake should be drained and renovated to eradicate gizzard shad.
- If not drained and renovated, Starve Hollow should continue to undergo an annual winter drawdown with a goal of a 50% reduction in volume during January and February.
- The DFW should maintain the 14.0-in minimum size limit on largemouth bass at Starve Hollow Lake.
- The DFW should continue to stock 2,320 channel catfish every two years. These channel catfish should average at least 8.0 in long to reduce mortality from bass predation.
- Submersed vegetation should continue to be monitored and controlled to manage the bass and bluegill fishery and to provide angler access.

LITERATURE CITED

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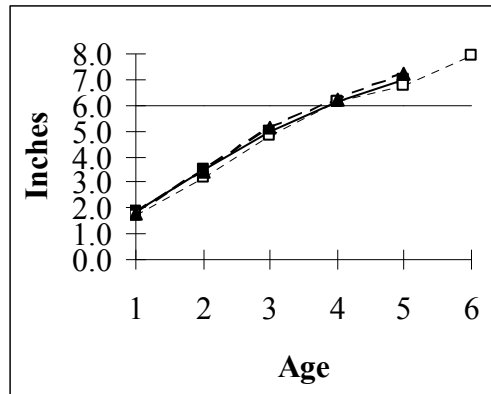


Figure 1. Starve Hollow bluegill growth from 2005 survey (solid line) compared to 2004 survey (dashed line) and to average bluegill growth observed in Fish Management District 8 impoundments (dotted line).

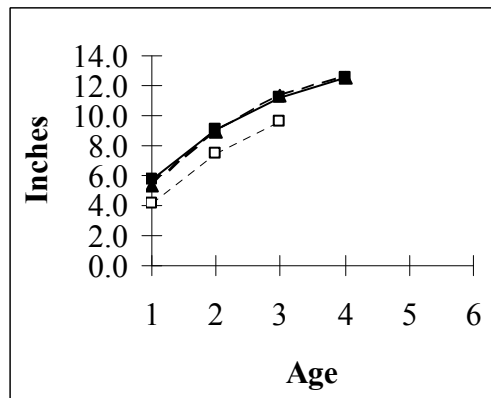


Figure 2. Starve Hollow gizzard shad growth from 2005 survey (solid line) compared to 2004 survey (dashed line) and to average gizzard shad growth observed in Fish Management District 8 impoundments (dotted line).

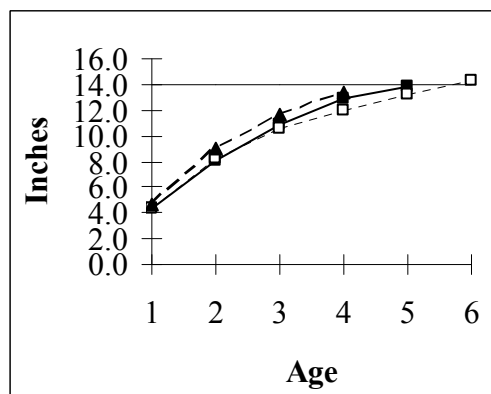


Figure 3. Starve Hollow largemouth bass growth from 2005 survey (solid line) compared to 2004 survey (dashed line) and to average largemouth bass growth observed in Fish Management District 8 impoundments (dotted line).